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1. Title of the Invention

KENCHI BLOCK

2. CLAIMS

(1) A concrete Kenchi block having a rectangular face plate and a support plate integrally connected by a beam, the block being characterized by:

a projection, which has step surfaces, located inward from the middle of an end of the face plate and the middle of an end of the support plate, wherein the projection projects from end faces of the face plate and the support plate and wherein the step surfaces are fit between inner corner surfaces of a face plate and a support plate of an identical, adjacent block.

(2) The Kenchi block according to claim 1, wherein the step surfaces are partial, cylindrical surfaces or partial, truncated conical surfaces.

3. Detailed Description of the Invention

The present invention relates to Kenchi blocks that are stacked along an inclined plane to form a wall.

Figs. 1 and 2 show typical shapes of prior art Kenchi blocks. As shown in Figs. 4 and 5, the blocks are stacked along an inclined plane of earth to form a wall 2 preventing soil 1 from sliding down. Reference numerals 3, 4 each denotes a unit of a Kenchi block. Each of the blocks 4 shown in Figs. 2, 5 has a rectangular face plate 5 and a support

plate 6, which are integrally connected by a beam 7. Each of the blocks 3 shown in Figs. 1, 4 includes a face plate 5 and a beam 7. Reference numeral 8 denotes concrete filled in the space between the stacked blocks 3 and in the space between the stacked blocks 4.

The blocks 3, which do not have the support plates 6, cannot be stacked alone (upon each other with empty space in between). Therefore, it is necessary to fill concrete 8 between the blocks 3 and solidify the concrete 8 before stacking the next row of blocks. This requires much time and effort. Contrarily, multiple rows of the blocks 4, which are provided with the support plates 6, may be stacked upon each other before filling the space between the blocks with concrete and solidifying the concrete. This enables efficient construction. However, the blocks 4 with the support plates 6 have a shortcoming in that careful attention is needed to accurately position the blocks 4 when stacking the blocks 4 without filling the space therebetween. This is because the blocks 4 only contact each other only at end faces of the face plates 5 and support plates 6. In addition, recesses and projections may be formed in the wall due to displacement of the blocks when filling the concrete 8. Further, in such blocks 4, stress may concentrate and break connecting portions between the beams 7 and the support plates 6. If there are portions in which adhesion between the blocks 4 and the concrete 8 is insufficient, such portions may break. Consequently, the blocks at such portions may be pushed out of the wall by the force produced by the soil.

A block provided with flanges 9 extending from the ends of a face plate 5 and a support plates 6, as shown in Fig. 3, prevents displacement of the blocks when stacking the blocks without filling the spaces in between. However, providing

such flanges 9 decreases the thickness and, hence, the strength of the end of the face plate 5. Further, a curved wall cannot be formed with such block.

This invention solves the above-described problems of the conventional Kenchi blocks. Accordingly, it is an object of the present invention to provide blocks that have a simple structure and prevent, without decreasing the strength of the blocks, displacement when stacking the blocks without filling the space between the blocks. It is another object of the invention to provide Kenchi blocks that are prevented from being pushed out by the force of soil even when the connecting portions between the beams and support plates of the blocks are damaged and that can be used to form a curved wall.

The Kenchi blocks according to the present invention are each provided with a projection 17 having step faces 15, 16, as shown in Figs. 6, 7. The projection 17 extends between the middle of an end face 13 of an end 11 of a face plate 5 of each of blocks 10a, 10b and the middle of an end face 14 of an end 12 of a support plate 6 of each of the blocks 10a, 10b. The step surfaces are fit between inner corner surfaces of a face plate and a support plate of an identical adjacent block. Figs. 6, 7 respectively show a first embodiment and a second embodiment according to the present invention. Reference alphabets a, b in Figs. 6, 7, respectively, denote differing portions in the first and the second embodiments, but are omitted in the specification.

Fig. 8(a) is a front view showing a wall formed by Kenchi blocks 10a, 10b. Fig. 8(b) is a cross-sectional front view showing the blocks 10a, 10b without surface plates 5. Fig. 8 shows block A, which includes a projection 17 having step surfaces 15, 16. The step surfaces 15, 16 of block A is fit between the inner corner surfaces of the face plate 5 and

the support plate 6 in blocks B, C, which are stacked above block A. This engages block A with blocks B, C. The lower corners of the face plate 5 and the support plate 6 in block A are fit to projections 17 of blocks D, E, which are located under block A. This engages block A with blocks D, E. Block A is further engaged with adjacent blocks F, G by means of blocks D, E. Thus, block A is engaged with every surrounding block B-G. The engagement facilitates the positioning of the blocks relative to each other when stacking the blocks and enables the stacking to be performed within a short period of time. Further, the blocks are not displaced when filling concrete. In addition, the strength of the blocks does not decrease and the shape of the blocks remains simple. Thus, the blocks do not complicate molding.

In a second embodiment, the surface steps 15b, 16b of projection 17b are partial, cylindrical surfaces or partial, truncated conical surfaces. As shown in Fig. 9, this enables the steps 15b, 16b to fit between corners of the face plate 5 and the support plate 6 when lower and upper adjacent blocks are arranged at certain angles as shown in Fig. 9. Therefore, a curved wall can be formed by mutually engaging the blocks 10b. In this case, the radius of the partial, cylindrical surfaces or the partial, truncated conical surfaces is substantially equal to the distance between the inner surfaces of the face plate 5 and the support plate 6. To curve the wall outward, it is necessary that the length L of the support plate 6 be shorter than length W of the face plate 5. However, the length of the support plate 6 can easily be adjusted by properly placing a filling in a cavity of a mold used to produce the block 10b.

As shown in Fig. 10, each of the blocks 10b of the second embodiment has a recess 18 provided in the middle of its projection 17b. Such recess 18 prevents each block from

being pushed outward even if a connecting portion between the rear plate 6 and the beam 7 breaks since the concrete 8 fills the recess 18.

As described above, the blocks of the present invention engage stacked blocks and prevent displacement of the blocks with the simple structure. The relative positions of the blocks are restricted by the mutual engagement of the blocks. Thus, the positioning of the blocks when staking the blocks is facilitated and performed within a short period of time.

The embodiment shown in Fig. 7 has the following advantages. A curved wall is formed by engaging the blocks. The blocks are prevented from jutting out from the wall even if the blocks are damaged.

4. Detailed Description of the Drawings

Figs. 1, 2 are perspective views showing prior art blocks. Figs. 4, 5 are cross-sectional views showing walls formed by stacking the prior art blocks. Fig. 3 is a perspective view of a prior art block provided with flanges for preventing displacement of the blocks. Fig. 6 is a perspective view showing a block according to a first embodiment of the present invention. Fig. 7 is a perspective view of a block according to a second embodiment of the present invention. Fig. 8(a) is a front view of a wall formed by the blocks of the present invention. Fig. 8(b) is a cross-sectional front view showing the blocks 10a, 10b without surface plates 5. Fig. 9 is a plan view showing mutual relations of the blocks of the second embodiment forming a curved wall. Fig. 10 is a partial cross-sectional view of the wall formed by the blocks of the second embodiment.

Detailed Description of Reference Numerals

5---face plate, 6---support plate, 7---beam, 10---Kenchi block, 11 and 12---end, 13 and 14--- end face, 15 and 16---

step surface, 17---projection